City level policy and institutional frameworks - A supporting or hindering factor for green and blue infrastructure?

Insights from five ENABLE cities

(Part of Task 2.3)

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Executive Summary

Green and blue infrastructure (GBI) has the potential to effectively slow down, halt and reverse the negative effects of human activities on the environment while safeguarding valuable ecosystem services that these natural settings provide, especially in urban areas. The successful implementation of GBI is linked to a variety of factors, especially so the policy and institutional framework in which they are embedded. Acknowledging this potential, this report aims to understand the policy contexts which foster or hinder the uptake and positive impacts of green and blue infrastructure across a range of European cities.

The work for this report has been conducted within the context of the Biodiversa-funded ENABLE project, and focuses on the project's five European case studies (Stockholm, Barcelona, Halle, Lodz and Oslo). For each city, a governance analysis was conducted, focusing on policies, regulations and programmes in place to foster or regulate GBI more generally and regarding specific GBI interventions. Across the cities, a total of 51 instruments relating to GBI were reported and included in the analysis. Subsequently, the (potential) impacts of each city's policy framework on GBI implementation, maintenance and monitoring are explored as well as the stakeholders and institutions involved in these processes. In a next step, the relevance and effectiveness of the analysed polices as well as barriers in establishing and maintaining GBI are assessed. Our findings offer conclusions on the effectiveness and success factors for GBI implementation, as well as overarching limitations.

The analysis revealed that the most common instrument type within the reviewed GBI-related policies is *plans/programmes*, followed by *guidance documents* and *strategies* and a few *laws and regulations*. In looking at the level of legal bindingness, the majority of instruments with information provided were found to be *non-legally binding* (64 %). The most frequently reported mechanisms were *regulatory*, *planning/zoning*, and *research/monitoring* in nature. Within these instruments, the cities illustrated that introducing standards on green space availability and/or accessibility within policy instruments as well as ensuring sufficient funding through targeted programmes and initiatives can be a powerful tool to support GBI implementation.

Of the reviewed policy instruments, almost half are expected to have high impact potential and a third to have medium impact potential. Regulatory and financial mechanisms are amongst those most likely to have a high or medium impacts. To complement this assessment, the policies were also evaluated for their effectiveness, taking into account the extent to which it has addressed GBI and its relevance and how the policy is intended to deliver change. On this basis, circa half of the instruments were evaluated as being of medium or low effectiveness, with only 4 % having been assessed as being highly effective.

Limitations to existing policy instruments were found in all steps of GBI implementation across the case studies. Lack of financial resources can affect early stages of GBI planning as well as continuous support beyond term cycles. In addition, the financial and temporal constraints of political action and a conflicting policy landscape in terms of priorities of different policies affect GBI implementation. Finally, unclear or missing responsibilities for GBI policy and planning limit implementation.

Across all of the case studies, representatives of multiple policy and planning levels were found to be involved in the decision making-processes that govern GBI. Other stakeholders are also involved to varying degrees in different stages of implementation. While public participation is legally mandated in some cities for certain types of government-driven GBI, other cities have limited precedents of

bottom-up or inclusive approaches and largely lack stakeholder involvement in planning, implementation, maintenance or monitoring processes.

Overall, the lack of financial resources and allocation of funds to invest in GBI is the major barrier to implementation on a regional and city level, as well as for specific GBI interventions. Furthermore, a lack of institutional capacity, knowledge and expertise, lack of trust between stakeholders, and missing of coordination between government departments as well as the absence of existing policy played a key role in the lack of investments into GBI interventions.

The insights from the five ENABLE cities show that a meaningful implementation of GBI requires a political commitment at the national as well as the city level in correspondence with a long-term vision and must be operationalised by appropriate policy instruments. Tailored guidance, tools to support implementation/decision-making and or action plans to accompany policy instruments can also be used to achieve the aims of specific policies or strategies and operationalise policies. Financial support through targeted programmes and initiatives are also key, fostering a shift from financing purely grey solutions to financing GBI or hybrid (green and grey) solutions and recognition of the benefits of natural capital in financing mechanisms. Finally, GBI should be integrated into existing policy frameworks rather than treating it as an isolated programme and therewith pursued together with other complementary objectives such as climate change mitigation and adaptation, human health and well-being, improving air quality, stimulating the local economy, conserving biodiversity, etc. Together, these actions and approaches can support an increased role of GBI as an integral part of sustainable urban development.

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1. Introduction

Cities offer a wide range of benefits to their citizens, including employment opportunities, cultural exchange and innovation. These benefits have spurred a massive flux of people to these urban centres, with over 75% of citizens living in cities despite comprising only 3% of the global area. Yet significant land-use changes across Europe in the last century have also led to negative effects, including noise pollution, island heat effects and a decrease in mental and physical health. Green and blue infrastructure (GBI) is increasingly highlighted as a possible solution to offset these modern-day challenges. In the context of ENABLE, GBI is defined as the arrangement and network of green and/or blue environmental components in a spatially structured landscape mosaic, together with the linkages and interactions between components that can deliver a wide range of ecosystem services and socio-economic benefits. However, their uptake and implementation is dependent on political and societal support and favourable framework conditions.

This report assesses the framework conditions for GBI in five case study cities from the ENABLE project (Oslo, Stockholm, Lodz, Halle and Barcelona – introduced in chapter 3.1 below), analysing the elements of successful GBI implementation on a policy and institutional level. The report begins with a governance analysis focusing on policies, regulations and programmes in place to foster or regulate GBI more generally and regarding specific GBI interventions. Subsequently, the (potential) impacts of each city's policy framework on GBI implementation, maintenance and monitoring are explored as well as the stakeholders and institutions involved in these processes. In a next step, the relevance and effectiveness of the analysed polices as well as barriers in establishing and maintaining GBI are assessed. Finally, recommendations for an improved policy and institutional framework to support the implementation of GBI are provided.

The findings will inform dialogues with the city stakeholders and be taken up in workshops, which are planned to take place in 2019 in each case study city. Together with other ENABLE outcomes that also address the policy and institutional scale - such as the analysis of barriers to access urban green space (WP4) and the resilience assessment (WP5), this analysis serves as a starting point for developing policy options to foster GBI processes at the municipality level and beyond.

Overview of case study cities and their GBI interventions

The focus of this report is on the five case study cities from the ENABLE project: Oslo, Stockholm, Lodz, Halle and Barcelona. A brief overview of each city and their respective GBI intervention is presented below, highlighting relevant demographic and green area factors in order to facilitate a better understanding of the subsequent governance analysis. Table 1 presents an overview of the key figures per case study city.

Figure 1: Location of the five ENABLE cities, i.e. Oslo (NO), Stockholm (SE), Halle (DE), Lodz (PL) and Barcelona (ES)

Table 1: Overview of key figures per case study city

Parameter	Oslo	Stockholm	Lodz	Barcelona	Halle
Population	630 000	2 248 000	700 000	5 537 674	236 991
Size in km²	454	6 519.2	293	7821.71	135.01
Share of green urban areas and forests (% of land area)	63.3	56.2	15.4	21.1	16.7
Median surface of accessible green urban areas (ha)	23.0	62.6	16.9	6.8	29.7
GBI Intervention	Green roofs and walls (building integrated green structure)	Nature Reserve Flaten	A green corridor along the Jasień River	Natural Park of Collserola	Urban/ community gardening, upgrading of existing areas

Population dynamics in the cities vary greatly, and should be kept in mind for their potential impact on availability of (green) space and regarding accessibility of the population to green urban areas. While the population in Halle and Lodz has shrunk by 0,5 % and 0,9 % between 2006 and 2012, the population in the other three cities has increased. Oslo shows the highest change in population (+2.3 %), followed by Stockholm with +1.7 %. Despite its population growth, Oslo is also the only city which managed an increase in green area (by 0.2 %). In contrast, Barcelona and Stockholm are experiencing a decline in green areas as one possible consequence of the increasing population. Both Halle and Lodz show a decline in green area by 0.2 %, noting that the change in population was twice as high in Lodz than in Halle. These numbers show that the decline in population has not has not resulted in land becoming vacant and being converted from sealed areas to urban green areas.

The availability of green areas (park and forest areas) in 2012 is on average 155 m² per capita in the ENABLE cities, with a range of 13 m² per capita in Barcelona and 472 m² per capita in Oslo. Highest per capita losses between 2006 and 2012 were observed in Oslo with 65 m² loss of green areas per capita. Losses in Stockholm sum up to 9 m² of green areas per capita and in Barcelona only 0,2 m² of green areas per capita. An increase of green per capita has been observed in Halle and Lodz with a gain of ca. 4 m² of green areas per capita in each city. This development probably results from the decline in population taking place at the same time.

Each of the ENABLE cities also focuses on a specific GBI intervention, which are also explored further in this report (see Chapter 5.2). These are listed in Table 1 and briefly introduced below:

Oslo – green roofs and walls

The aim of the Oslo GBI intervention to develop methods and tools for enabling the inclusion of multiple benefits from blue-green infrastructure into private and public decision-making in Oslo's built area. A number of pilot or "beta-version" tools exist for quantifying the benefits of blue-green infrastructure, but they are as yet poorly tested, and even more poorly integrated into the planning and building permitting process in Oslo. Focus is on the assessment on blue-green structures designed for the prime purpose surface run-off management and flood control (such as green roofs and walls).

Stockholm – Nature Reserve Flaten

The GBI intervention focuses on the establishment, maintenance and development of ormally protected areas as functionally connected components of urban systems. The actual case is the nature reserve Flaten and its surrounding landscape. The GBI benefits in focus are biodiversity and recreation. The Flaten nature reserve itself is located in the Stockholm municipality, whereas the larger Flaten landscape also includes areas in the Nacka and Tyresö municipalities.

Lodz – green corridor along the Jasien River

The GBI intervention focuses on the restoration of the Jasien river, which is an initiative of the Municipal Planning Office and the Lodz Waterworks Company. It aims to deculvert a small section of Jasien and one of its tributaries – Lamus. It is part of the local spatial development plan for one of the central areas in the city. The section of 100m of the Lamus river will be uncovered in the Kiliński Park to make it visible to the citizens and build awareness.

Barcelona – Natural Park of Collserola

Since 1987, the Collserola massif has been managed under a special protection plan. Currently, it is protected as a Natural Park and it is part of the Natura 2000 network and aims to protect both the social and ecological functions of these areas.

Currently a new special conservation and public use plan is being developed to timely address Collserola's new status as protected area, responding to the challenge of preserving biodiversity while providing ecosystem services to the population in its highly urbanized surrounding areas. This plan will also consider the diverse stakeholder interests and tackle the current high pressure on the park due to the frequent use by the residents.

Halle – urban/community gardening

For Halle, the main challenge is the conversion – mainly reconstruction and upgrading – of built-up neighbourhoods in different parts/districts of the city fostering upgrading of existing open space and formerly built areas and greening of brownfields, creation of parks, pocket parks etc. Against this background the GBI interventions(s) in Halle focus on i) Neutopia, an urban and social gardening initiative, which is located within a refabricated area and which also offers opportunities to develop and upgrade open spaces to the benefit of the residents; and ii) Freiimfelde, a formerly neglected and partly abandoned area close to the railway station, which has been developed and upgraded based on a citizens' initiative. In cooperation with the city of Halle a Citizens Neighbourhood's Concept ("Bürgerschaftliches Quartierskonzept", publicly available) with vision and targets until the year 2025 has been developed.

2. Methodological approach

The objective of this analysis is to highlight commonalities and differences across case studies in reference to their institutional or political frameworks, which in turn promote or hinder GBI interventions and affect the share and accessibility of urban green (see Table 1). The data for the analysis was gathered by means of a 16-questions survey (see Table 2). In an effort to understand the context in which GBI are evolving, and factors which enable or limited their potential uptake and impact, the questionnaire was designed with the following objectives (addressed in chapters 3, 4, and 5 respectively):

a. Identify and analyse relevant policies, strategies, programmes and planning processes at municipality level (and national level, where relevant), including the types of requirements they cover and how each impacts GBI development and implementation;

b. Describe and analyse the institutional/governance system in place, including: key actors and their roles within planning processes and agenda setting, decision-making processes in place, and the involvement of the community and citizens;

c. Evaluate why policies have a positive or limited impact on GBI, by looking at: their implementation, the effects of combining and integrating policies, existing incoherencies, contradictions and gaps in objectives, and measures and existing barriers to the development and implementation of GBI.

The questionnaires were filled in by the ENABLE case study partners[1], through interviews with local stakeholders and a comprehensive literature review; the drafted responses were then validated by a key city expert. Below is a list of the questions included in the questionnaire and the respective chapter in which the responses can be found.

[1] i.e. Lodz University, Humboldt University Berlin, Autonomous University of Barcelona, the Norwegian Institute for Nature Research, and Stockholm Resilience Centre

N#	Question	Respective chapter
1	Please briefly describe the current approach to governing GBI within the city region?	**4**
2	Which policies, regulations, strategies and programmes are in place and foster or regulate GBI within the city region and what are their positive/negative impacts for GBI in the city region?	**3**
3	Which policies, regulations, strategies and programmes are in place that foster or regulate your specific GBI intervention?	**3**
4	Taking account of the findings of the previous questions, please summarize: - if current polices, regulation, strategies, etc. have been effective to date in promoting your specific GBI intervention and what their potential is in this regard for the future? - What are the current gaps among policies and strategies with regards to supporting your specific GBI intervention and /or GBI at a city region level?	**3, 5**
5	Have guidance documents, tools, or targeted dissemination materials been developed as part of the policies/regulations/strategies listed in Question 2 to support broader GBI implementation in the city region more generally? Are any of these of specific relevance or aid to your specific GBI intervention?	**3**
6	Are there other mechanisms in place that promote and/or encourage investment in your specific GBI intervention, other than those outlined above?	**3, 5**
7	Are you aware of any policies, which have clear potential to negatively impact or hinder the effective implementation/maintenance/monitoring of your specific GBI intervention?	**3**
8	Which institutions are formally responsible for setting access regulations to urban green spaces? Which are more and less prominent stakeholders with this regard?	**4**
9	Does the city have specific standard on urban green space availability? What is this standard (does it indicate green space type, size, distance from residents etc.) and is it legally binding?	**3**
10	Is there any political commitment regarding accessibility (or at least availability) of urban green spaces? Please cite along with the document type.	**3**
11	What have the barriers been to investing in/establishing/maintaining a) your specific GBI intervention and b) at city region level in general?	**5**
12	Which stakeholders are involved in planning, decision-making, implementation, maintenance and monitoring/evaluation processes of your specific GBI intervention and what is their specific role?	**4**
13	How can the decision-making process for your specific GBI intervention be described? Does this vary at different stages of implementation (e.g. design, implementation, maintenance, monitoring, evaluation, etc.)?	**4**
14	Are any mechanisms in place within your specific GBI intervention's design to foster adaptive management during the lifetime of the intervention?	**4**
15	Please describe any participatory methods/forms of community/citizen involvement which took place as part of the planning/management process for your specific GBI intervention.	**4**
16	Is there available evidence or examples of (formal) decision-making and planning processes in your specific GBI intervention and/or at the city region level to take citizen perceptions and preferences for specific ecosystem services into account and/or to evaluated the distribution of GBI ecosystem services and benefits between different societal groups among the citizens?	**4**

Table 2: Questions from the questionnaire, as the basis for the data protocols

3. City level policy frameworks supporting GBI

Urban green and blue infrastructure emerges as a consequence of a variety of drivers, not least of which is the policy frameworks in which they are embedded. Such frameworks consist of numerous instruments which interact with one another to directly or indirectly influence the planning and implementation of GBI. These instruments can be of various types (e.g. plans/programmes, guidance/education, strategies, laws or regulations, projects), levels of bindingness (e.g. legally binding or aiming to inspire voluntary action), and scales (e.g. EU, national or regional/local). Together, they provide for target setting, setting basic guidelines for the design and implementation of GBI and – sometimes - encompass funding schemes for supporting implementation. As such, urban GBI can be the result of legislative requirements for land use or simply part of a general strategy for biodiversity protection or climate adaptation of a city or region, for example. This chapter recognizes the importance of these frameworks for fostering and regulating GBI within the city regions, and explores key policies at different scales as well as their (potential) impacts, limitations and supportive materials (e.g. tools, guidance documents, financing initiatives, etc.).

3.1 Overview of key policies to foster or regulate GBI within the city regions

A wide range of instruments were highlighted by the case studies as being relevant for the implementation and regulation of GBI within the respective city regions (see Annex A for a full list of policy instruments included in the following analysis). Details were provided on the type of instrument and mechanism, geographic scale, level of bindingness, impact potential and type of impact, amongst other categories (see Table 3).

Table 3. Categories explored per policy instrument

Category	Response options
Type of instrument	Plan/programme; Guidance/education; Strategy; Law/regulation; Project
Geographic scale	Local; City; County; Municipality; Regional; National
Level of bindingness	Binding; non-binding
Type of mechanism	Regulatory; Planning/zoning; Research/monitoring; Guidance/education; Financial; Administrative
Impact potential	High; Medium; Low
Type of impact	Environmental; Social; Economic

Across the city regions, a total of 51 instruments relating to GBI were reported and included in the analysis[2]. The most common **instrument type** was *plans/programmes* (57 %). In Barcelona, for example, all reported instruments fell into this category (e.g. 'Barcelona Biodiversity and Green Infrastructure Plan 2020', 'General Metropolitan Plan', and 'Trees for Life – Master Plan for Barcelona's Trees'). *Guidance documents* (20 %) were the second most frequent (e.g. Halle's 'Landscape planning development concept'), followed closely by *strategies* (16 %), such as Oslo's 'Strategy for City Trees' and 'Strategy for Building Integrated Green Structures'. *Laws and regulations* comprised another 5 %

[2] The selected instruments were estimated to be most relevant within the GBI discussion by the respective city experts, and were limited to a maximum of 5 instruments within the city region and 5 instruments for the specific GBI intervention.

of the reported instruments, including Lodz's 'Municipal Management Protection Policy 2020+' and national 'Water Law'. Finally, there was one reported *project* - a research and monitoring project in Flaten, Stockholm aiming to make the municipality's nature and culture reserves accessible for residents and develop the recreational and ecological values in these areas. The distribution of instrument types across the case study cities is presented in Figure 2 below.

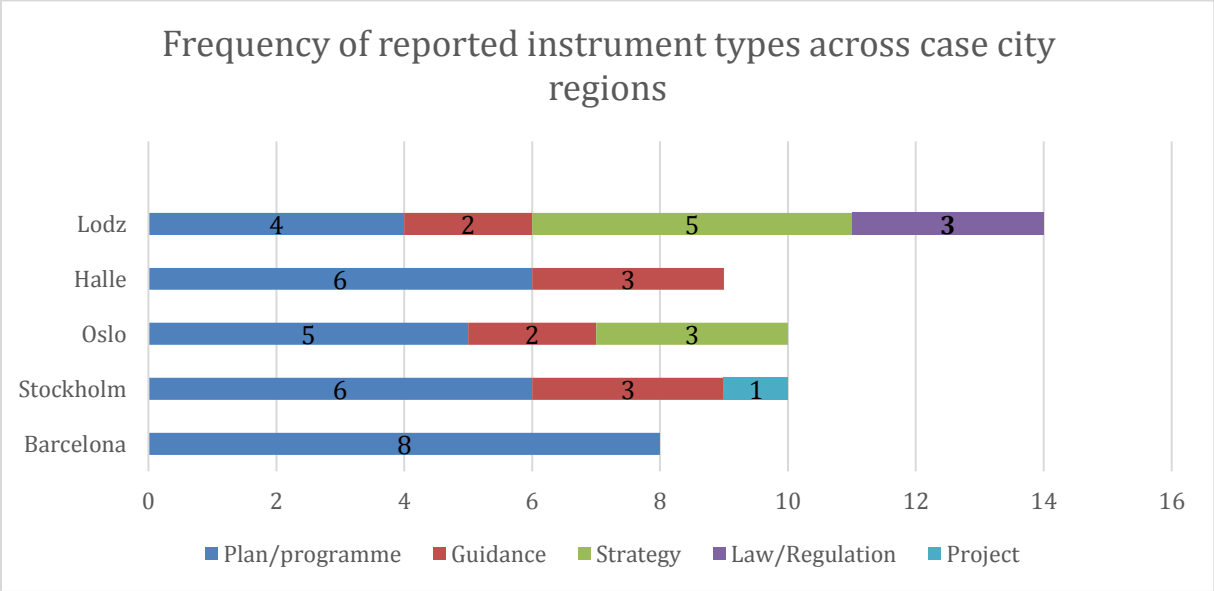


Figure 2. Frequency of reported instrument types across case study cities

In looking at the **level of legal bindingness**, the majority of instruments with information provided[3] were found to be *non-legally binding* (64 %), with the remaining 36 % being *legally binding*. A distribution of the bindingness across instrument types and the case studies is illustrated in **Fehler! Verweisquelle konnte nicht gefunden werden.** below. As to be expected, all laws/regulations are legally binding while plans/programmes vary. In Halle, for example, the Regional Development Plan for the city region is binding, while the Future City 2050 ('Zukunftsstadt 2050') programme is non-binding and rather an incentive program promoted by the Federal Ministry for Education and Research to support cities in implementing their visions for the future. The large majority of guidance and strategy instruments are non-binding (78 % and 88 %, respectively) as well as the aforementioned Swedish project.

[3] Of the 51 instruments reported, four did not provide any information on the legal bindingness (ca. 8 %).

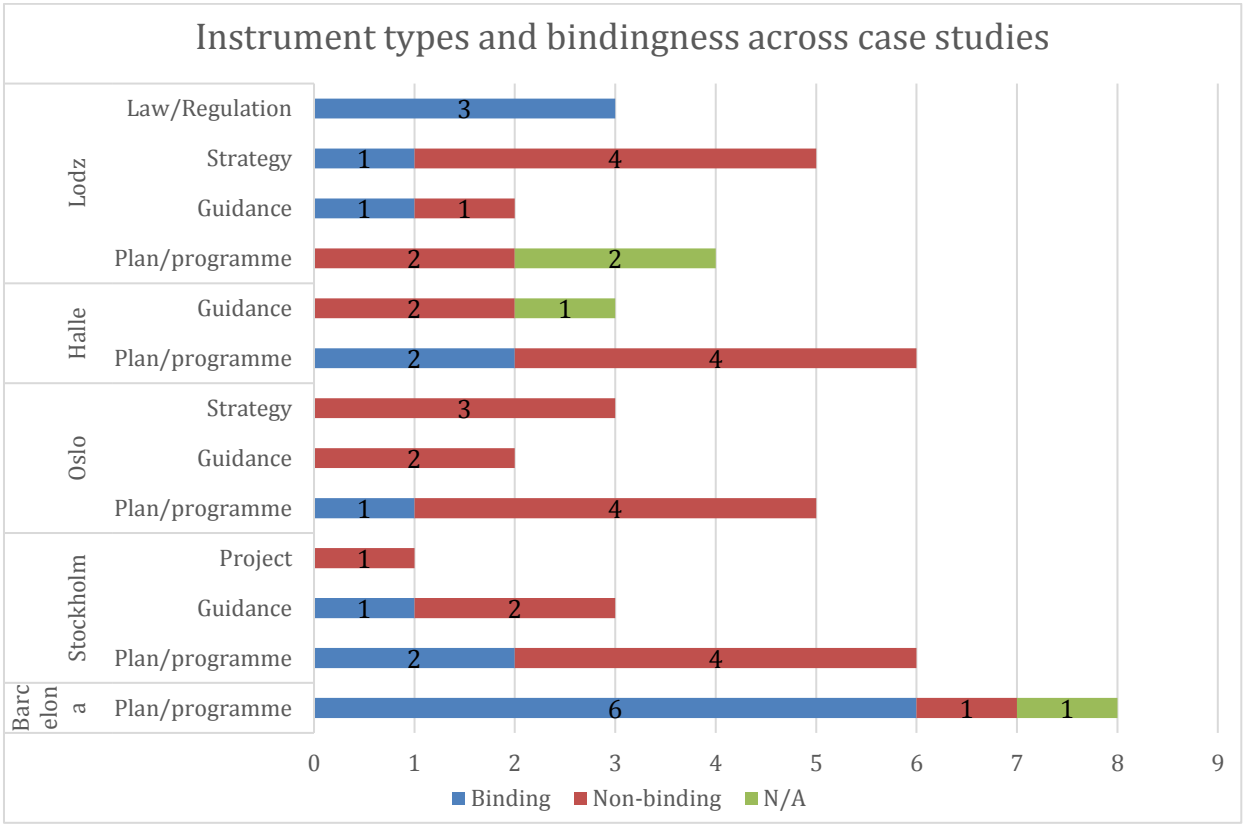


Figure 3. Instrument types and bindingness across case studies

Further information was provided on the mechanism types included in each instrument and their potential to create positive social, economic and/or environmental impacts (see section 3.3). Six **types of mechanisms** were reported (see Table 4), with multiple selections possible per instrument. The most frequently reported mechanisms were *regulatory* (39%), *planning/zoning* (21%), and *research/monitoring* (18%), followed by *guidance/education* (14%), *financial* (7%) and *administrative* (1%). Examples of each of these mechanism types are provided in the table below.

Table 4: Example mechanism types across case study instruments

Name of instrument & city	Type of mechanism	Aims and objectives
Biodiversity and Green Infrastructure Plan 2020 (Barcelona)	Regulatory	To preserve and enhance the natural heritage present in the city to enable citizens to benefit from and enjoy it.
City tree strategy (Oslo)	Regulatory	To manage trees to contribute to common health and wellbeing: city trees shall contribute to solving several environmental problems, conservation of biodiversity, and have a central architectural roll in urban spaces.
Trees for Life: Master Plan for Barcelona's Trees	Regulatory; planning/zoning	To achieve a more sustainable management and maintenance which improve the living conditions for Barcelona's tree population; to maximize the services and functions that healthy trees provide for the city and the well-being of people.

Name of instrument & city	Type of mechanism	Aims and objectives
Integrated Urban Development Concept (Halle)	Regulatory; planning/zoning	To frame other sectoral or spatially-detailed plans as well as the allocation of funding and subsidies; to build the image of "green city", improve the connectivity of free spaces and the experience they provide, taking into account the needs of the residents and visitors, while increasing and integrating areas for nature protection.
Strategy for Green Infrastructure (Stockholm)	Research/monitoring	To adopt approach and consider the different values of green infrastructure; to position the nature reserves in the larger landscape.
City Climate Adaptation Plans (Lodz)	Guidance/education; Research/monitoring, Financial	To facilitate environmental projects and encourage collaboration between local decision makers and citizens; includes: awareness raising, research on threats to citizens/infrastructure, funding streams, and monitoring of e.g. air quality, flood risk, meteorological and climatological hazards.
Strategy and Action Plan for Surface Water (Oslo)	Administrative	To set out management objectives, in part by calculating feasibility in a large number of examples to make the case for a budget allocation.

3.2 Achieving GBI goals through target setting, provision of tools and guidance documents, and financing initiatives

In order to achieve city-wide or broader GBI goals, policy instruments (i) can include specific targets or standards for certain aspects of GBI design and implementation (e.g. for green space availability or accessibility), (ii) can be accompanied by guidance documents, tools, or dissemination materials, or (iii) include targeted funding programmes and investments in GBI. While there are many more aspects to GBI policies that may support the successful implementation and maintenance of GBI, these three categories are highlighted in this chapter as they have been outlined by each of the case study cities and been identified as having the potential to play an important role in the GBI implementation landscape.

Green space availability and accessibility targets and standards

Introducing standards on green space availability and/or accessibility within policy instruments can be a powerful tool to support GBI implementation. Looking at those instruments focusing on green space availability and accessibility as reported by the ENABLE case study cities, the analysis reveals that none of the cities currently have a legally binding standard on these aspects. Such standards for urban green spaces are, however, planned to be introduced in Lodz in its new Masterplan. Furthermore, Barcelona and Stockholm already have guiding, non-binding targets and/or standards in place.

In **Lodz**, several documents mentioned accessibility to public (in particular green) spaces of certain quality as one of the key objectives for improved quality of life (e.g. the *Municipal Management and Environmental Protection Policy of the City of Lodz 2020+* and the *Spatial Development Strategy of Lodz 2020+*). Furthermore, the draft version of the city's masterplan - *The Study of Determinants and Directions of Spatial Development* - indicates specific standards which may be formally introduced in 2018 when it gets adopted. The plan outlines that in residential areas, the maximum Euclidean distance to green spaces of certain size should be as follows:

Table 5: Definition of standards on green space accessibility in Lodz

Functional units in the city	Green space in ha	Euclidean distance to a green space in m
Core urban area	≥3	800
	≥1<3	400
	≥0,2<1	200
Large housing estates (blocks of flats) outside of the core urban area, high population density	≥3	500
	≥1<3	400
	≥0,2<1	200
Outskirts of the city, lower density of population	≥3	1000

Furthermore, there is to be a minimum contribution of 25 % biologically active area in relation to the total investment area. While these standards are not yet implemented, their planning alone indicates important progress in city planning. The new Masterplan would represent the first time that such indicators appear in a city policy, representing a growing awareness of decision-makers and increased openness to include scientific evidence and recommendations in planning decisions.

Barcelona, as another example, has set the goal of enhancing municipal green spaces by 1 m^2 per inhabitant by 2030 (against the baseline of 2016) in its 2017 stimulus programme for urban green infrastructure. This document highlights that:

> *"Currently, the city has a standard of ca. 7 m^2 of green space per city resident, excluding Collserola. In some districts the figure is well below the standard, e.g. 1.85 m^2 in Eixample district (in contrast to Cerdà's original project) and 3.15 m^2 in Gràcia. That is why it is a priority to create more functional urban green space. Aerial photo-based NDVI analysis of the green cover includes trees and green areas that are not classified as green spaces (in the PGM) and excludes areas which, while classified as green, are actually not green (e.g. sealed public squares): hence it offers us a better, but still insufficient situation (11.2 m^2/resident)*."

Stockholm does indeed have qualitative standards at the national and city regional level, with more quantified standards sometimes being found at municipal level, but these are non-binding and lacking the legal means to enforce their fulfilment. Looking at the Stockholm municipality standard, guidance is provided in the program "*Den gröna promenadstaden*" (2006) which in part aims for citizens to have good access to parks and green areas that supports a rich and healthy urban life and that meets the needs of the growing population". The formulation is similar in the new (2017) park programme "*Grönare Stockholm*", which specifies the following targets:

- Good park and nature availability: The amount park land must be high enough to satisfy the residents need for outdoor recreation and manage the high number of visitors.
- Within 200 m: A green oasis, play (nature play or playground), area with good light conditions, be in the sun, walks
- Within 500 m: Richness of flowers, ballgames/play, park play, picnic, sledging
- Within 1000 m or easy access by public transportation: Outdoor swimming, animal keeping, gardening/agriculture, running, forest experiences, views, water views, wild nature, skating

Similarly, the Nacka municipality in Stockholm recommends that there should be a maximum of 300 m walking distance to parks or green area (optimal 50 m) and maximum 3 km to larger green area (optimal 1 km) from housing areas (from the *municipal green structure programme)*. The Tyresö municipality in Stockholm also outlines that residents should have access to high quality nature and park, i.e.:

- 50 m from house/no specific size without passing larger roads or landscape barriers – urban nature or small park for nature play, sunbathing or playground play
- 200 m from the house/min 0,3 ha without passing larger roads or landscape barriers – urban park for play, green oasis, sunbathing, ballgames, social interaction
- 500 (800) m from house/large enough for many activities and visitors without passing larger roads or landscape barriers – richness of flowers, play, green oasis, sunbathing, ballgames, walks, social interaction, sledging, events.
- 1000 m from house or reachable with public transportation/at least 300-400 m^2/inhabitant – outdoor swimming, natural flowers, animal keeping, picnic, foraging, walks, cycling, skate, ski, hike, view, education, wild nature

Finally, in **Halle**, there are more indirect linkages to encouraging connectivity and enhancement of green areas, without putting forward a specific political commitment regarding accessibility or availability. Here, the *ISEK 2025* which aims to guarantee accessibility along the Saale riverbanks but does not mention any threshold. Furthermore, permits for new housing are only granted if part of the land can be access by the public to ensure accessibility/walkway along the river.

On the basis of the cities examined here, it appears that increasing efforts are being made to take account of accessibility and availability of green spaces. However, existing standards are overwhelmingly non-binding and often presented as recommendations and targets rather than mandatory instruments. Significant room for improvement exists in this field, with potential to increase consideration of the quality of green spaces being discussed as well as to pass binding standards for access and availability of urban green spaces as a tool for achieving increased societal wellbeing.

Guidance documents, tools, or dissemination materials to support GBI implementation

The number and type of reported guidance documents, tools or targeted dissemination materials being developed as part of the listed policy instruments or to support GBI more broadly varied greatly across the case study cities. While there were no dedicated guidance documents or tools in Halle and Lodz, Stockholm and Barcelona provided numerous examples. Information on Oslo also includes a relevant tool which has actually become mandatory in the Oslo region. These examples are outlined below.

Stockholm has seen a range of green infrastructure-related guidance documents and tools produced as part of the listed policy instruments. For example, in relation to the *Regional plan, RUFS 2010*, the Planning division at Stockholm County Council and the Stockholm County Administrative Board have together worked for decades with the concepts, policies and tools regarding the ten green wedges. These include in-depth reports, assessment of ecologically weak links, setting up collaborative platforms for management of single wedges and articulating the values of the wedges in landscape analysis and ecosystem services. Owing much to the early recognition of spatial connections and landscape dynamics, the city also has several network-based modelling tools for assessing spatial

connections and positional qualities of individual sites. Finally, in combination with the *Ten outdoor recreation goals*, the Stockholm County Administrative Board has supported the initiative of nature guides from environmental NGOs in certain areas[4] and developed two outing guides[5] as well as a GIS based information material and a mobile application (Naturkartan[6]).

In **Barcelona**, there are several guidance documents and campaigns that are not directly relevant for Collserola, but which have been developed at a city level, including e.g.:

- Summary documents for the *Barcelona Green Infrastructure Plan (2013) and the Stimulus programme for the city's urban green infrastructure: Government measure* (2017), which have been accompanied with an intensive dissemination campaign.
- Dissemination for the *TREES FOR LIFE - Master Plan for Barcelona's Trees* (2017) has started.
- A strong media campaign (local, national and international) supports the *Superblocks Strategy* ('Omplim de vida els carrers – La implementació de les superilles a Barcelona), yet some reports provide a critical view.

Furthermore, a summary and dissemination report is currently under development for SIXTELL[7]. For the planning of Collserola, the tool provides a general guidance, but the resolution is not sufficient for detailed planning purposes.

Finally, in **Oslo**, the Blue green factor (BGF) Guidance manual[8] has been developed as a multi-criteria scoring tool which makes it possible to compare property developments. The tool has recommended minimum standards, which function as voluntary incentives in that progressive developers may in use the BGF as an "eco-labelling" strategy in the future. The BGF manual has been made mandatory in several smaller municipalities in the Oslo Region, but not in Oslo proper.

Investments in GBI

National and regional governments can provide funding for GBI through targeted programmes and initiatives as an important contribution to achieving GBI targets; such funds can also be complemented with private funds or initiatives by citizens.

In **Sweden**, for example, nature conservation and outdoor recreation programmes allow local actors to apply for project funding for specific actions. Relevant funding programmes in **Germany** focus rather on innovative pilot projects, such as:

- "Zukunftsstadt 2050" (city of the future 2050), promoted by the Federal Ministry for Education and Research to support selected cities in implementing their visions for the future;
- the ExWoST Project (Experimental housing and urban development) - Green Urban Labs, promoted by the Federal State Institute for Building, City and Spatial Research to support local authorities during three years in developing and testing ideas for green development in urban spaces or

[4] http://utinaturen.nu/
[5] http://www.lansstyrelsen.se/stockholm/Sv/djur-och-natur/friluftsliv/utflyktsguide/Pages/default.aspx
[6] http://www.lansstyrelsen.se/stockholm/Sv/nyheter/2015/Pages/hitta-ut-i-lanets-naturreservat-med-ny-app.aspx
[7] (Territorial Information System for the Network of Open Areas in the province of Barcelona)
[8] http://www.miljodirektoratet.no/Global/klimatilpasning/Bl%C3%A5gr%C3%B8nn%20faktor/BGF%20Veileder%20byggesak%20Hoveddelen%202014.01.28.pdf

- the new funding programme “Future City Green” promoted by the Federal Ministry of the Interior, Building and Community to support cities in the improvement of urban green areas.

In **Barcelona**, in addition to financial support for the park management and the planning at higher scale (Àrea Metropolitana de Barcelona, Diputació de Barcelona and Generalitat de Catalunya), the adjacent municipalities fund several different measures in place to promote the Natural Park of Collserola, mainly in the form of connecting municipal green areas to the park. In the city of Lodz, “The Green Backyards” programme has been established and the Regional Fund finances educational gardens for Environmental Protection and Water Management in Lodz.

Private actors and institute can also play an important role in investing in GBI. In **Halle**, Freiimelde and Neutopia (two local GBI initiatives) foundations have provided investments for buying land and establishing GBI elements. In **Poland**, the existence and maintenance of green and blue infrastructure (mainly trees and water reservoirs) are supported by NGOs, special programmes or funding agencies, e.g. Foundation for Sustainable Development, Sendzimir Foundation or academic institutions (e.g. European Regional Centre for Ecohydrology, University of Lodz).

Local citizens can also stimulate investments in GBI as shown by the city of **Lodz**. Inhabitants can postulate planting new trees and contribute to changes in urban green space provisioning through participation in the participatory budgeting. City residents can vote via Internet for selected actions, propositions and decide about, e.g. planting trees, creating new park, building bicycle paths or playgrounds in the whole city and in their neighbourhood, and city to be covered from the municipal budget.

Investments are often also encouraged with the increase of green urban areas or the development of new building areas in attractive landscapes. In **Stockholm**, close to Flaten, new city districts like Norra Djurgårdsstaden or Stora Sköndal often attract urban development actors shaping a joint image in order to sell apartments to highest possible price. That image often consists of high sustainability standards of which some are realised, but others are not. The better image, the higher price and hence possibility to add sustainability interventions like gardening opportunities, green roofs and surface runoff water systems.

3.3 Impact of policy instruments

Of the reviewed policy instruments, almost half (44 %) are expected to have high **impact potential**, a third (33 %) to have medium impact potential, and the remaining fifth (20 %) to have low impact potential. The figure below portrays the distribution of impact potential across mechanism types.

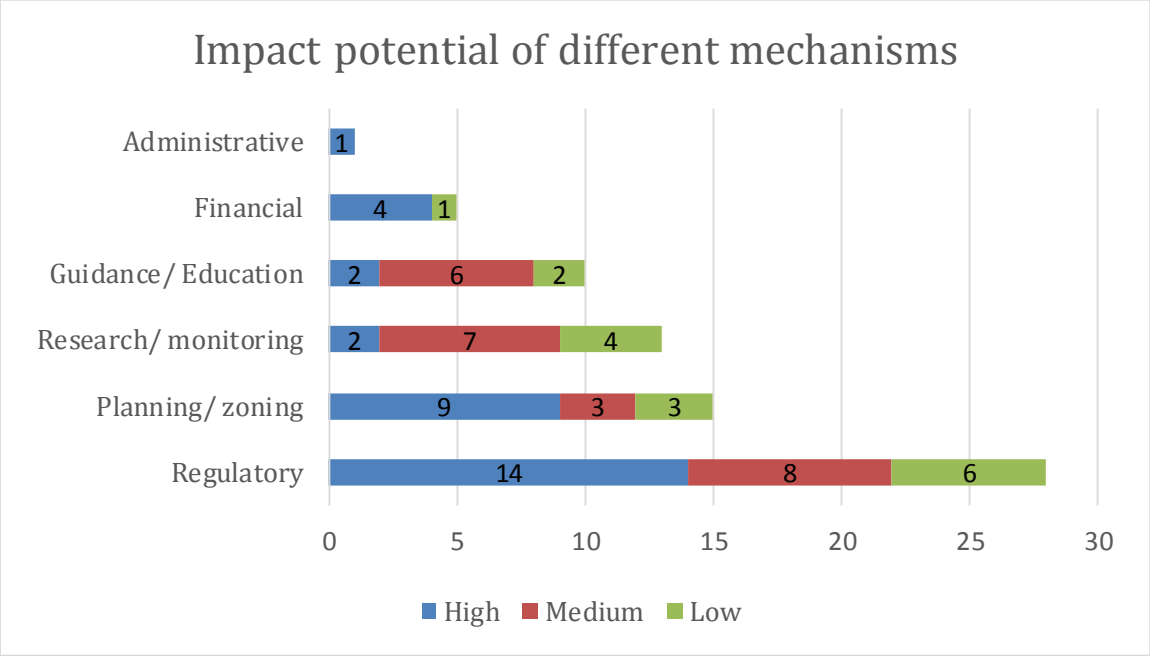


Figure 4: Impact potential of different mechanism types

Regulatory and financial mechanisms are largely expected to have a high or medium impacts. This is true for, for example, for Oslo's Municipal Plan (regulatory mechanism), which includes goals for GHG emissions, pollution, and transportation as well as access to high quality networked green spaces. Other relevant aspects of the binding policy instrument include mentions of urban food production and the management of green spaces for handling storm water. Given these aims, the impact potential is *high* and addresses the conservation of biodiversity through restored ecosystems; increased recreational opportunities and access to green spaces; increased human well-being; increased gentrification; and reduced damages from floods. The German 'ExWoST Project – Green Urban Labs' is an example of a financial instrument with *high* impact potential. The national programme provides financial and technical support for a variety of projects, not least to develop the ideas of greening brownfield areas in the GBI case study site of Freiimfelde in Halle. On the other hand, only a small fraction of research/monitoring and guidance/education mechanisms are estimated to have high impact potential. Exceptions in these two categories include the research/monitoring mechanism in the Stockholm's non-binding Strategy for Green Infrastructure, which is expected to have a high impact potential if implemented (expected 2018), and the guidance/education mechanism in Lodz's Municipal Management and Environmental Protection Policy 2020+.

The city partners were additionally asked to provide information on the type of the expected impacts, i.e. if they are of *an environmental, social* or *economic* character. For all instruments in which this information was provided, potential impacts were foreseen for all three categories (i.e. environmental, economic and social). The large majority of instruments, however, did not provide any information for this category. Of those that did provide information:

- The most prevalent **environmental impact** reported across policy instruments was an "*Increased number of GBI elements (e.g. trees, protected areas, green spaces, agricultural and woodland areas, re-naturalised areas, natural heritage)". Other less frequent environmental impacts include the "Avoidance of flooding (from e.g. reduced storm water overflow)" and "Improved air quality*".

- The most commonly reported **economic impact** is *"Enhanced speculation and increased housing prices associated with gentrification"* (a negative impact).
- The most frequent **social impacts** included: "*Increased access to green and blue spaces"; "Increased human well-being and quality of life"*; and "*Increase in recreational opportunities"*.

While most of the impacts are of a positive nature, there are also clear trade-offs in some cases. Under the economic impacts, for example, *"enhanced speculation and increased housing prices associated with gentrification", "increased costs for street cleaning and from tree-related damages" and "opportunity costs incurred due to restrictions on land development*" can all be seen as negative impacts of GBI policies.

Table 6 provides an overview of the different impact types that were reported for the policy instruments of the ENABLE project. The number in parentheses next to each example shows the number of policy instruments that listed the corresponding impact type, indicating which types are relevant for a large number of policy instruments.

Table 6: Overview of reported impacts across policy instruments

Type of impact	Examples of impacts (# of relevant policy instruments)
Environmental	- Increased number of GBI elements (e.g. trees, protected areas, green spaces, agricultural and woodland areas, re-naturalised areas, natural heritage) (17) - Avoidance of flooding (from e.g. reduced storm water overflow) (6) - Improved air quality (5) - Increased connectivity of green infrastructure (4) - Enhanced provision of ecosystem services through improved quality of green and blue spaces (e.g. via restoration) (4) - Mitigation of climate change (e.g. reduction of heat island effect, increased carbon capture and lower emission levels) (3) - Contribute to biodiversity conservation (3) - Reduced noise levels (3) - Increased resilience against climate change (3) - Decrease of GBI areas and protected areas caused by prioritising other land uses (e.g. due to urbanisation pressure) (2) - Reduced waste through improved life cycle waste management (1) - Reduced irrigation needs (1) - Improved water quality (1)
Economic	- Enhanced speculation and increased housing prices associated with gentrification (6) - Increased employment opportunities (2) - Increased costs for street cleaning and from tree-related damages (2) - Opportunity costs incurred due to restrictions on land development (1) - Reduced costs for irrigation (1) - Reduced damages from flooding (1)

Social	- Increased access to green and blue spaces (10) - Increased human well-being and quality of life (10) - Increase in recreational opportunities (7) - Enhanced cultural identity (2) - Increase in sustainable mobility options and use thereof (2) - Improved education opportunities (2) - Enhanced awareness and social recognition of ecosystem services and GBI in the private and public sectors (2) - Increase in level of collaboration with inhabitants (1)

Where available, more detailed information was provided on the specific quantified impacts of instruments. As these can provide useful insights on the different types of GBI that were increased or scope/type of ecosystem services that were enhanced as a result of the instrument, a few illustrative examples of the environmental impacts of select policies from the ENABLE case study cities have been outlined in more detail in Box 1 below.

Box 1: Examples of quantified environmental impacts of select ENABLE city policy instruments

Quantified environmental impacts of select policy instruments: Illustrative examples from ENABLE case studies

Barcelona – Trees for Life: Master Plan for Barcelona's Trees (2017):
This instrument has increased the city's tree cover by 5 %, which lead to an overall 30 % of the city's surface area being covered by trees. Furthermore, the tree heritage has been kept diverse, as no single tree species accounts for more than 15 % of the total population within the urban area. Resilience to climate change has been supported by ensuring that 40 % of tree species within the urban areas are adapted to climate change (as opposed to the current 30 %). The city's identity has also been enhanced through the tree programme, as children in Barcelona's primary schools appreciate and can identify the trees in their neighbourhood.

Stockholm - Aldrig långt till naturen (County-wide programme for protection of urban nature):
The programme has been going on for ten years and have been extended by 71 new reserves. These proposed new reserves represent a doubling of the protected area in Stockholm County. As of 2015, 44 of the proposed areas were successfully protected, with the establishment process having started in an additional 18. Other areas not proposed in the programme have also gained 'protected' status.

Lodz – Municipal Management and Environmental Protection Policy of the City of Lodz 2020+ (2012):
The policy lead to a maintained or increasing share of forest area and protected areas in the city. The share of publically accessible green spaces in the city area increased overall. The number of pruned trees in parks and along streets is 3900 per year, and the ratio of planted to removed trees along streets is 160 %. Quality standards for parks and green squares has increased to higher quality classes. The number of reservoirs and water retention basins has increased.

3.4 Limitations of existing policy instruments

The five case studies identified limitations in their respective policy frameworks for GBI. While some issues were unique to a city, other limitations were reflected in multiple case studies. These overarching barriers to implementation of green and blue solutions are presented, including: budget constraints, lacking integration of GBI into the policy framework, conflicting policy landscape and administrative conflicts.

Budget constraints

The planning stage of GBI strategies comprises the crucial first steps towards the realisation of a project and is subject to multiple external influences, and especially sensitive to realistic and secure budgeting. In addition to insufficient funds and limited funding opportunities across cities in Europe, an identified limitation to the development of projects was the constraint in continuity due to budgeting failing to extend past political term cycles (e.g. 4-year election periods). Projects which are only at the early stage of or on their way towards generating positive impacts can be cut short if financial stability is not maintained throughout the project's intended duration and implementation.

Lacking integration of GBI into the policy framework

Several case studies identified that the concept of GBI was not sufficiently integrated into the policy framework, and that it was not mandatory to integrate GBI into decision-making processes. In Lodz, there is a complete lack of documents specifically related to the implementation of the Blue-Green Network Concept and river rehabilitation, as well as lack of operationalization and detailed interventions; concrete tools to implement key concepts are also absent. In the case of Barcelona, adaptive park management is a main pillar in urban planning; however, the realization of this adaptive management approach holds certain risks regarding the extent in which sustainability and socio-economic criteria will be considered in decision-making processes due to the stakeholders involved. In Halle, it was identified that adjusted planning tools and balanced objectives would need to be implemented to realize the policy targets in reference to GBI.

Conflicting policy landscape

Other case studies highlighted conflicts between policies that integrate GBI and the priorities of other sectoral policies, hindering potential GBI benefits. City strategy documents in Lodz concentrate on grey infrastructure-related actions rather that integrating the implementation of green spaces as a priority target. Similarly, in Oslo, the government provides no incentive for the use of green roofs, which ultimately limits implementation efforts. In addition, a lot of processes connected to greening private areas are still steered heavily through stakeholder dialogues and cooperation rather than policy implementation. A need for evaluating and revising older management plans was identified (in Stockholm).

Administrative conflicts

In Stockholm, responsibilities for the implementation of GBI measures are unclear given that outdoor recreation, education, nature conservation and urban park management are located in different administrative units. In Lodz, competencies related to different aspects of GBI functioning and development are spread out across a number of agencies, which often operate solely on the basis of sectoral priorities. Furthermore, a lack of support for municipal policies by regional and national law was identified across case studies as hindering extensive implementation of measures.

Further limitations

Limitations to existing policy instruments were found across all steps of GBI implementation in the case studies. Lack of financial resources can affect early stages of GBI planning as well as continuous support beyond term cycles. In addition, financial and temporal constraints of political action and a conflicting policy landscape in terms of the sometimes contradictory priorities of different policies affect the implementation of GBI. Finally, gaps or overlaps in clearly assigning responsibilities for GBI policy and planning limit implementation.

4. Decision-making processes and stakeholder involvement

The successful implementation of green and blue infrastructure in urban settings is dependent on a variety of different factors linked to decision-making processes and stakeholder involvement. While decision-making processes determine how quickly and robustly GBI can be implemented, the involvement of different stakeholders can positively stimulate implementation and ensure that investments serve to benefit society members as widely as possible. To integrate stakeholder opinions into decision-making processes, societal preferences and values relating to GBI have to be recorded and taken into account. The following chapter presents an overview of decision-making processes that govern GBI in the five case studies, highlighting the involvement of stakeholders in GBI-related processes and the role that preferences and values towards GBI play in implementation processes.

4.1 Decision-making processes to govern GBI

Multiple policy and planning levels and actors are involved in the decision making-processes that govern GBI. In Sweden, for example, national legislation sets the institutional framework for actions at local level and most of the actual decision-making power is vested in the municipal level (with some sector-specific exceptions). The municipalities decide on and approve land use plans and management decisions and are responsible for safeguarding the wellbeing of residents as well as biodiversity conservation and providing access to green space and outdoor recreation. In Barcelona, the Metropolitan Master Plan governing GBI implementation covers Barcelona as well as 35 further municipalities within the metropolitan area of Barcelona.

In other cases, cities are lacking a framework to govern GBI-related decisions. The region of Lodz, for example, has no specific approach for governing GBI. Issues related to GBI in the city are not dealt with in a systematic manner; even though they are referred to in the newest policy documents of the city, these general references are not backed by any document that would help translate them into practice of urban/municipal management. There is no such thing as coordinated GBI management and collaboration between different stakeholders involved in GBI governance is poor.

In Halle, governing GBI within the city region is mainly supported by planning documents. The city of Halle plays a major role in this process as it has direct competencies and responsibilities for spatial planning and managing GBI, and is also responsible for coordinating relevant stakeholders for GBI planning, implementation, maintenance and monitoring processes. It is also noteworthy that in some cases the city of Halle promotes a bottom-up approach to governing GBI (e.g. in Freiimfelde, see Box 3).

4.2 Stakeholders involved in GBI planning, implementation, maintenance and monitoring

The type and degree of involvement of stakeholders in GBI-related processes varies greatly depending on the city in which the interventions are being implemented and the type of intervention itself. While public participation is legally mandated in some cities for certain types of government-driven GBI (e.g. protected area establishment in Stockholm), other cities have limited precedents of bottom-up or inclusive approaches and largely lack stakeholder involvement in planning, implementation, maintenance or monitoring processes. Furthermore, there are strong differences in the type of authority or institution responsible for setting access rights to urban green spaces. The following findings are based on the specific GBI interventions being focused on in each case study.

Planning and design

In the case of GBI interventions overseen by local government bodies, it is often either legally required or a precedent for the general public and other stakeholders to be invited into the planning processes as well as in the development of related government plans and policies/strategies. In Stockholm and Barcelona, for example, the development of regional and municipal plans and the design of the GBI interventions are opened to the public for stakeholder, expert and general input and reflection. This can take the form of meetings, remittance procedures, consultations, online commenting opportunities, etc. While these processes sometimes have low levels of engagement, they are nevertheless recognized for offering a forum for debate and discussion and bring the general public into a stronger role within government-led planning processes and explorations of alternative forms for planning and design.

Box 2: PepNAT Plan, Barcelona: An example of public consultation in action

The design and development process of the PepNAT Plan in Barcelona offered multiple possibilities for the general public to be involved. Open invitations were extended to: comment on the government-published document via web, post or in person; participate in open public meetings; hold interest group meetings to solicit more specific information (e.g. cyclists and landowners in Collserola); and attend informational meetings with councillors and municipal staff.

In other cities, competitions have been held to gather multifunctional design ideas (Oslo's green roofs) or consultations have been conducted with scientific bodies (e.g. with the Martin Luther University in Halle) for support in the design process.

Governance and physical implementation/maintenance

The diversity of GBI interventions across the case study cities are governed and physically managed by an equally diverse mix of stakeholder types. In the Natural Park of Collserola in Barcelona, for example, there is a scientific and a general advisory board. The latter is comprised of 54 formally recognized stakeholder groups and meets biannually to provide advice which must be considered in decision making processes by the executive board. The board itself consists of a range of government bodies including the Catalan government, the Barcelona Provincial Council, the Metropolitan Area of Barcelona and the 9 adjacent municipalities and is involved in the park's design, implementation and management. As for physical maintenance of the GBI interventions, this is either assumed by those with the decision-making power outlined above or by outside parties. While Barcelona's park is maintained by an independent entity in Barcelona and the rooftops are maintained by private gardeners in Oslo, the municipalities themselves are responsible for Lodz's GBI maintenance (with contributions from citizens and NGOs). In Stockholm, municipalities also assume a major role in

physical maintenance alongside civil society groups like allotment garden associations and Swedish Society for Nature Conservation.

There are also strong differences across the cases regarding the setting of access regulations to the respective GBI intervention areas. While access to Stockholm and Barcelona's GBI's are managed by dedicated decision boards/consortiums having to do only with that area[9], a range of city authorities are formally responsible in Lodz (e.g. the City Office, Urban Greenery Board, Municipal Planning Office, Department for Architecture and Urbanization of the City Office). In Halle, public green spaces that are not subject to some kind of special regulation (e.g. nature protection) are regulated at the city level by the City Council.

Monitoring

In the case of Stockholm, the intervention is monitored by public bodies (e.g. the municipalities, Stockholm Water and Waste, and a public water conservation association) as well as by civic groups like the Swedish Society for Nature Conservation. Monitoring in Lodz and Barcelona is conducted by scientific parties (the University of Lodz and European Regional Centre for Ecohydrology in the former, and a scientific advisory board in the latter). NGOs and citizens are also involved in Lodz through citizen science approaches.

The different stages of implementing and maintaining functional GBI in an urban setting are to a large part dependent on stakeholder involvement. The planning and design of GBI benefits from local participation processes through i.e. workshops with the broad public while the implementation process may benefit from different institutional branches working together. Overall, the five cities show different advancements in reference to stakeholder involvement, with stakeholder involvement not always mandatory but definitely beneficial to the process of GBI implementation and maintenance.

4.3 The role of preferences and values in GBI implementation

Preferences and values are mainly integrated into GBI decision-making processes through public participation taking place at different stages of GBI implementation. In some cases, the legal framework integrates public consultation into GBI decision-making processes. In Stockholm, for example, all regional and municipal plans and policy strategies are subject to a consultation process where they are opened up for stakeholder/expert/general input and reflection. For the most part, however, the integration of the preferences and values of the public are not mandatory, but only apply to specific projects.

Project initiation/co-creation

In some cases, the initiation for a GBI project came from the citizens' side. Local stakeholders, such as urban neighbourhood groups, took into account their own preferences for their surroundings and brought these ideas to public authority. In the city of Halle, this initiation led to the results that the City of Halle mandated a neighbourhood group, which uses public art to raise awareness for an abandoned urban area, to develop a Citizens Neighbourhood's Concept ("Bürgerschaftliches Quartierskonzept"), with vision and targets until the year 2025. In this way, the city directly mandated the citizens of FreiImfelde to design/plan their own district. In Lodz, residents voted on a public online

[9] Access regulations to the Flaten nature reserve are set by the nature reserve decision board, while usage in the larger Flaten landscape is decided by municipal politicians and public and private land owners.

platform to be involved in the co-creation of a public beach on the Jasien River, one of the examples where residents can vote for the creation or renewal of a GBI through the civic budget in the city.

Box 3: Project co-creation example for Halle, "Frei im Felde"

Quartierskonzept "Frei im Felde"

Frei im Felde is an example for a successful bottom-up approach to governing GBI. The "Urbane Nachbarschaft Freiimfelde" (urban neighbourhood Freiimfelde) initiative brought together the City of Halle, the Freiraumgallerie (a collective of artists that created and organised murals in the neighbourhood to heighten its value) and the Montag Stiftung Urbane Räume (a foundation) as partners. Its mission is to promote a participatory urban development in which multiple stakeholders are asked to take part in the decision-making process for an area. The Freiraumgallerie was mandated by the City of Halle to develop a Citizens Neighbourhood's Concept ("Bürgerschaftliches Quartierskonzept", publicly available), with a vision and targets for the area for the timespan until the year 2025. Various workshops took place with local residents at their homes and information material was disseminated to stakeholders in multiple languages during the development of the concept. In this way, the city directly mandated the citizens of Freimfelde to design/plan their own district. Even implementation was a joint process, i.e. through a construction festival and 'all you can plant' festival.

Involvement in planning

During the planning phase of a GBI project, public participation through surveyed preferences and values, is a common approach. In Barcelona, the Special Plan for the Protection of the Natural Environment and Landscape of the Collserola Mountain followed an integrated public approbation process, in which comments on published documents were received through personal initiative of the public, and public meetings were held in each involved municipality as well as specific interest groups. For the area of Flaten in Stockholm, visitor studies have been performed in the nature reserve, including questions regarding accessibility, transportation, and activities, which fed into the planning process for the area. For the revitalization of the city centre of Lodz, workshops and social consultations through interviews determined the preferences of the citizens.

Evaluation of plans

If the planning phase of a project is conducted without public consultation, public stakeholders may still be involved at a later stage in the process through evaluation of plans drawn up by political authorities. In Oslo, the Agency for Urban Environment held several workshops to engage relevant stakeholders the green roofs strategy for the city.

Stakeholder involvement in the planning and design phase of GBI implementation has the potential to elevate benefits of GBI elements and linked ecosystem services when preferences and values of the wider public are taken into account when selecting areas and elements for investment. An integrative approach to including preferences for GBI avoids the design of green areas that are not actively used by the target group. This approach has proven successful in the majority of case study cities, where integration of preferences and values for GBI has led to the realisation of joint visions of both the administrative city and the public.

5. Relevance and effectiveness of policies in fostering GBI

Whether or not policy frameworks have a positive impact on GBI and can be considered to be effective for the uptake and implementation of GBI depends on their objectives and targets as well as the support, compliance and enforcement mechanisms they have in place. Further variables that can influence the realisation of GBI alongside the policy framework are the type of stakeholders and interests involved in the decision making process (see section **Fehler! Verweisquelle konnte nicht gefunden werden.**), investments, barriers to GBI implementation (see **Fehler! Verweisquelle konnte nicht gefunden werden.**), and the consideration of preferences and values of citizens in such processes (see **Fehler! Verweisquelle konnte nicht gefunden werden.**) (see Figure 5). Other variables that can play a role include the economic interests of private stakeholders, availability of open spaces, and property rights, for example. In most cases, such variables can only be assessed in qualitative terms. In the following section, the relevance and effectiveness of policies will be assessed as well as barriers to GBI implementation across the cities.

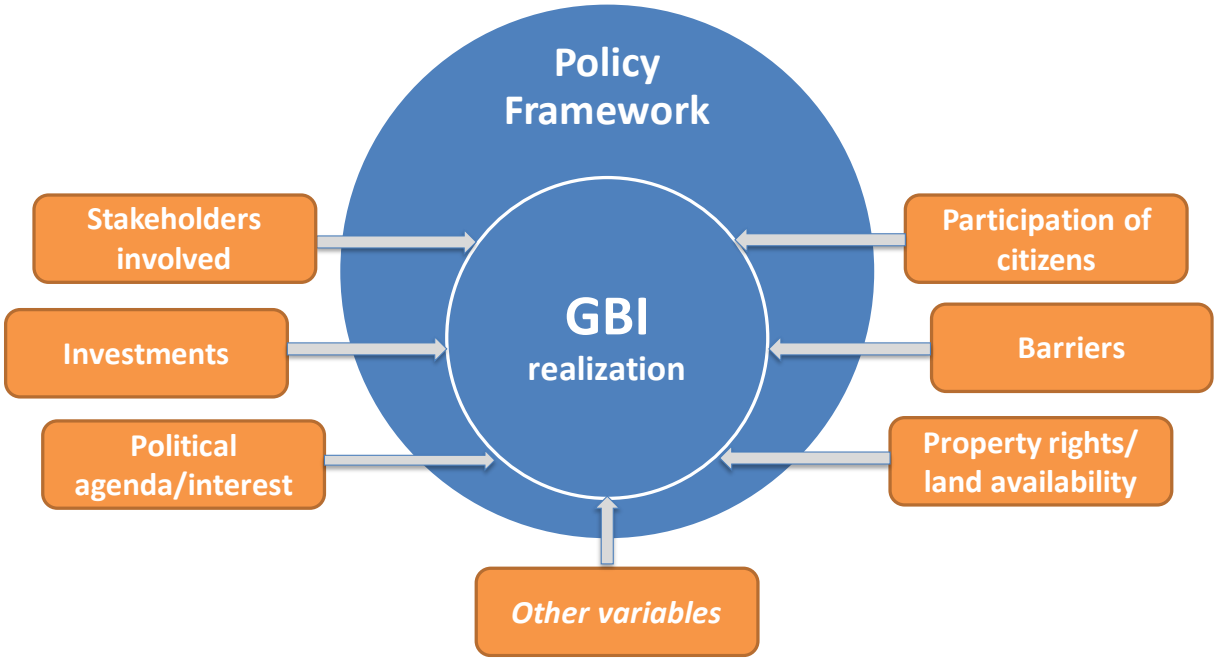


Figure 5: Variables influencing the realisation of GBI

The following tables illustrates the diverse types of variables that can influence the implementation of GBI in cities, highlighting examples per ENABLE case study city. Here, it should be considered that each variable influences the process of planning and implementing GBI to a different degree depending on the local city context.

Table 7: (Non-exhaustive) List of variables which influence the implementation of GBI in cities

Relevance of policy (average)[10]	Investments through…	Participation of citizens	(Key) Barriers in the city region
Barcelona			
Medium	Public financial support for the park management and connecting municipal green areas to the park	• Participatory planning meetings to develop user concepts for the Natural Park of Collserola	• Public opposition (including neighbours and commercials) in relation to the Superblocks plan[11] • Restrictions on e.g. agricultural production in the city and thereby hampering the creation of (private) horticultural production sites as well as the activity of bee keeping (in current planning procedures)
Halle			
Medium	National programmes promoting pilot and innovative actions and improvement of urban green areas; support via foundations to buy land and establish GBI	• Information events, consultation/workshops • Co-creation and Co-development of user concepts of green areas (eg Citizens Park in Freiimfelde), Joint implementation (Neutopia) • An online communication platform	• Lack of financial resources, Low investments from private actors and business • Lack of data about impact of GBI on health, recreation and climate change
Oslo			
Medium	n/a	• Workshops to engage the relevant stakeholders in the scoping the green roofs strategy for the city	• Lack of a business case and demonstration projects for GBI (e.g. green roofs) • Lacking experience with modern green roofs
Lodz			
Low-High	Regional Fund promoting educational gardens for Environmental Protection and Water Management, Local "The Green Backyards" programme; financial support though private actors (NGOs, foundations..)	• Residents can vote for the creation or renewal of the GBI spending the civic budget • Workshops and consultations related to local development plans and the revitalization of the city center	• Lack of institutional capacity, knowledge and expertise, collaboration between territorial entities and trust • Lack of financial resources, too much concentration on technical and infrastructural solutions • Lack of data, risk assessments, feasibility studies, no communication and dialogue on regional development options
Stockholm			
High	National nature conservation and outdoor recreation programmes	• (Informing) Public consultation processes • Engagement with schools to create signs for nature information (Flaten area) • Increasing citizens engagement in the construction of new residential areas	Priorisation of other land uses (e.g. housing) over GBI areas despite the high level of awareness and knowledge

[10] For more information see section 5.1
[11] This plan aims at reducing private transport by 21 % and transforms streets (among other uses) into GBI.

5.1 Policy relevance and effectiveness in promoting GBI

In this section we assess the effectiveness of existing policies to foster and promote GBI. In this context the relevance of policy objectives need to be considered. Moreover, such assessment should also take into account how the policy is intended to deliver change, i.e. the implementation rule, extension arrangements and control and enforcement requirements and what impacts have been observed (see Box 4). The extent to which it is possible to assess effectiveness depends on the availability of the literature gathered in the city reports.

Box 4: Definition of policy relevance and effectiveness

Level of relevance

For the purposes of this analysis, relevance is defined as the extent to which a policy's objectives are pertinent to GBI planning and implementation. Based on this qualitative assessment, the extent to which a particular policy is considered relevant to GBI will be scored as follows:

- Low level: The policy does not appear to be designed in a way that addresses GBI.
- Moderate level: The policy measure is relevant to GBI at the broadest level in terms of the objectives of the policy, but there is no evidence of a more detailed focus or tailoring of the policy on the particular aspects of GBI deemed most important
- High level: The policy is considered to be highly relevant and tailored to fostering GBI.

Level of effectiveness

An assessment of the effectiveness of a policy takes into account the extent to which the policy under assessment has addressed GBI, the relevance of its objectives and actions and (potential) impacts.

- Low level: There are gaps in relevance in the policy and there is little evidence of support, compliance and enforcement mechanisms in place to ensure that policy action is effective, there is nor or little evidence of positive changes and impact on the implementation of GBI
- Moderate level: Positive changes or impacts are not discernible via the evaluation, but the policy sets out actions, enforcement, compliance and support mechanisms that are deemed appropriate and that all the necessary attributes are in place to enable the policy to be effective to foster GBI.
- High level: The policy is considered to be effective and positive changes in practices and/or positive impacts on GBI have occurred as a consequence of the policy.

Using these definitions, a qualitative assessment was conducted based on data provided by the city authors and is intended to provide an indication of the relevance and the effectiveness of the analysed policies. In some cases, policies are rather new and their (positive) impact on GBI still need to be demonstrated. For some policies, no data on the impact is available as an impact assessment is not always mandatory and is often challenging to measure. This assessment is therefore likely to change as additional assessment data becomes available in the future. The results of this assessment are presented in Figure 6.

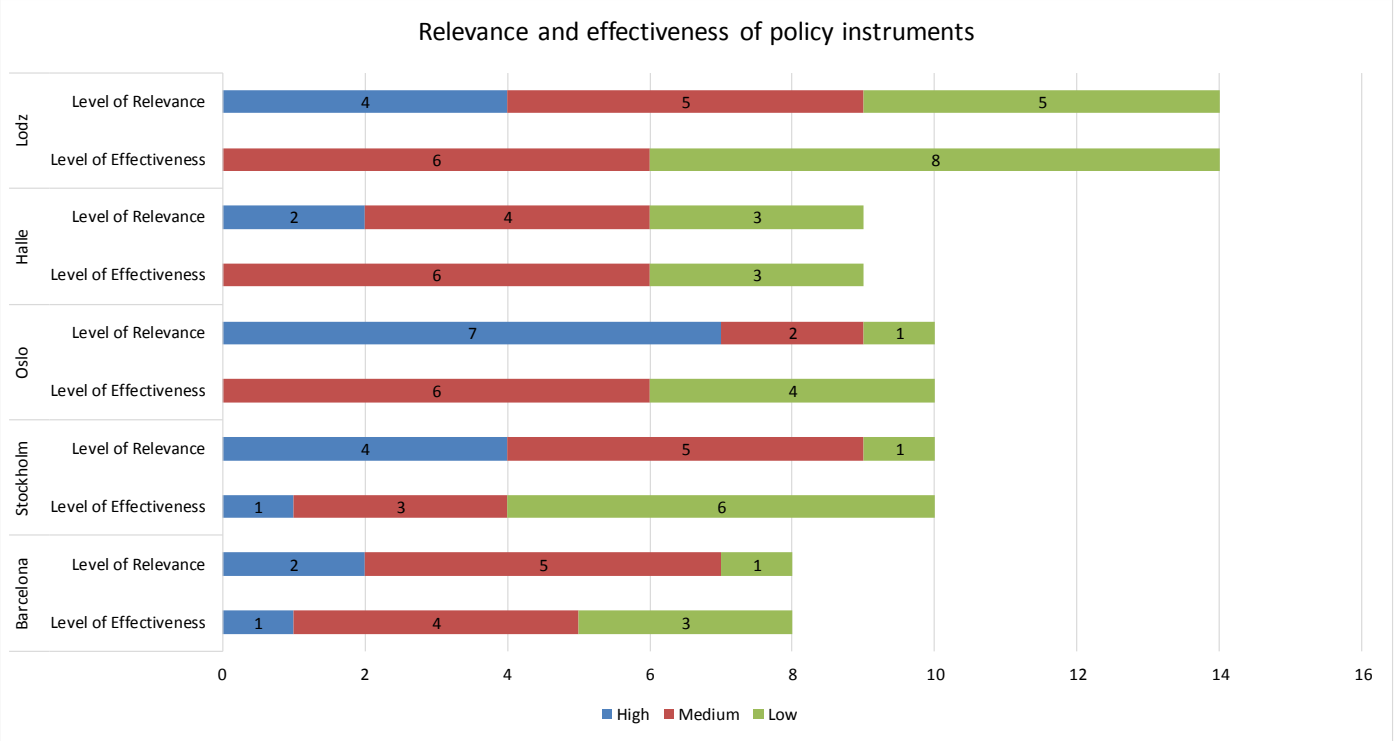


Figure 6: GBI Relevance and effectiveness of policy instrument in the ENABLE cities

The analysis indicates that all cities have included policy instruments in their review that have highly relevant objectives tailored to fostering GBI. The *level of relevance* for 37% of the policy instruments has been assessed as high, for 41% as medium and for 22% as low. The *level of effectiveness*, on the other hand, is predominantly only moderate or low. This scoring is often a consequence of these policies lacking evidence on their impact or due to them missing support, compliance and/or enforcement mechanisms. Only two cities have policy instruments that were assessed as being highly effective, namely:

- **Barcelona** (Barcelona Biodiversity and Green Infrastructure Plan 2020 (2013) and Stimulus programme for the city's urban green infrastructure), and
- **Stockholm** (Programme for protection of urban nature by all municipalities in the County).

Overall, the effectiveness for 49% of the policy instruments has been assessed as medium and for 4 % as low; only 4% of the policy instruments are assessed as being highly effective.

Whether or not GBI policies are effective in practice also highly depends on the extent to which a city can balance the various - and in many cases conflicting - economic, social and environmental interests across stakeholders and decision makers. As illustrated by the cities, there are many examples of how green space plans and strategies have been overrun by development plans for buildings, business and/or infrastructure. The case of Lodz illustrates that the lack of a strategy (that would link city greenery and green belt with any economic options for land owners) combined with low land prices for agricultural areas in a suburban context results in a massive loss of forested and agricultural land, which is traded to estate companies. Similar developments can also be observed in many other European cities. Further barriers to the implementation of GBI at city level are outlined in the following section.

5.2 Barriers to investing in GBI establishment and maintenance

In the five ENABLE cities, barriers to investing in the establishment and maintenance of GBI at the **city-region level** were identified as being of a political, financial, institutional, cultural or technical nature, or being connected to information or planning barriers (see Figure 7). Political barriers are those connected to a lack of political commitment, for example failing to make GBI a priority for action or impeding interests with i.e. economic development. Financial barriers can be connected to a lack in funding resources, low allocations of EU funds or low investments from the private sector. Institutional barriers are present in a lack of institutional capacity, knowledge and expertise, or in a lack of trust between stakeholders and institutions. Technical barriers can occur in the shape of missing technical information on the types of actions needed to facilitate GBI development and establishment. A lack of data, risk assessments, feasibility studies etc. make up barriers in information provision while planning barriers are defined by a lack of coordination between government departments, absence of policy or strategy frameworks and a lack of preparatory work. Examples from the cities are provided for each category below.

A *cultural barrier* in Barcelona was that the public does not agree with the plan to reduce private transport and transform streets into GBI. In Oslo, the lack of experience with modern green roofs has resulted in a lack of acceptance, which ultimately hinders their implementation.

Political barriers can be see, for example, in the city level in Lodz. Here, a lack of political commitment to translate general declarations into practical guidelines hindered actions as well as mismanagement due to ambiguous regulations.

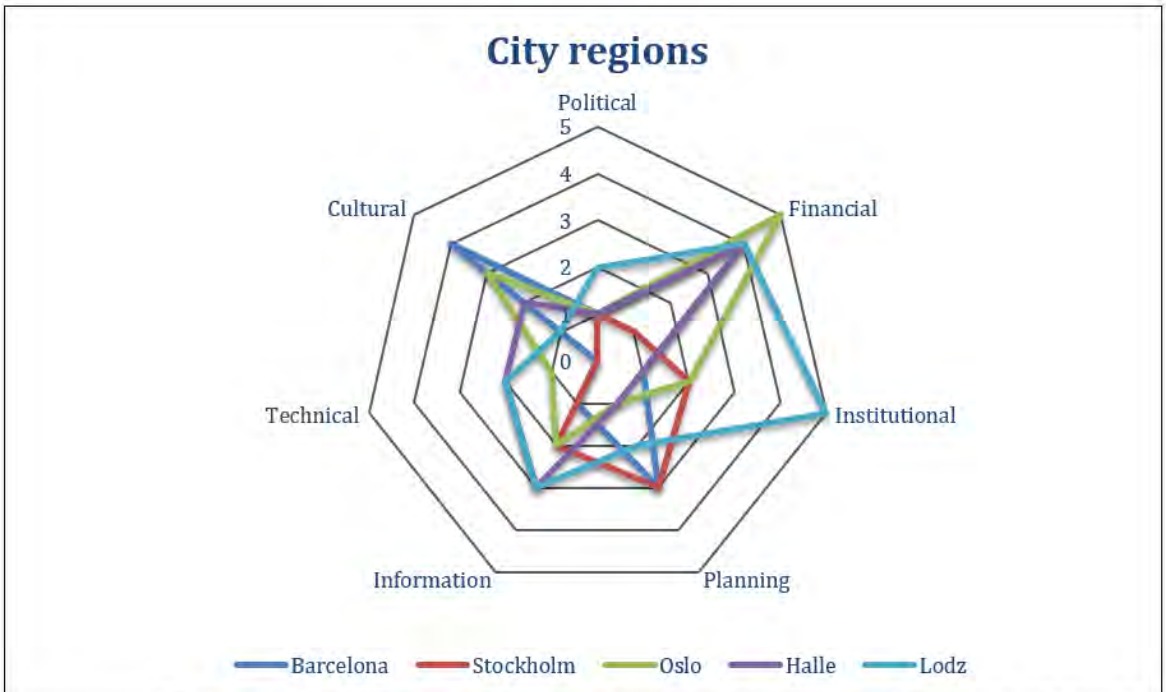
Financial support for GBI on the city level is generally low, given that as funds are concentrated on technical and infrastructural solutions to environmental issues, rather than recognizing the benefits of natural capital in funding mechanisms. In fact, an insufficient financial resources is the most common barrier reported across the ENABLE cities.

In the greater Stockholm area, *institutional barriers* played a role, as a lack of capacity for handling cases at both municipal and regional levels was identified. This lead to a long process of establishing protected areas, even after the plans were formulated.

In Barcelona, there is an occasional lack of capacity to collaborate across departments on the city level. In addition, master plans for urban planning restrict GBI implementation by spatially determining the type of land-uses permitted on a *planning* level.

In Halle, planners and other governance actors highlight insufficient evidence and data on the impact of GBI on health and recreation as being a barrier. Free data on green spaces and activities would support GBI actions and activities in Halle further. In particular, there is a lack of knowledge about the role of green for health issues of residents (e.g. on specific vulnerable groups) as well as on the climate mitigating effects of GBI. *Information* on access and preferences on GBI could feed further planning initiatives and strategies. While spatial maps of green roof potential have been developed for Oslo, the financial and economic cost-benefit analysis for Oslo specifically is still lacking for the implementation of the GBI intervention. In Barcelona, coherent planning to enhance ecosystem services will only be possible if additional studies on the topic are published.

For Halle, there is a lack of qualified workers possessing the *technical* skills and knowledge to implement and plan for GBI. In Lodz, a lack of experts focused on nature-based solutions functioned as a barrier.



	Political	Financial	Institutional	Planning	Information	Technical	Cultural
Barcelona	1	4	1	3	1	0	4
Stockholm	1	1	2	3	2	0	0
Oslo	1	5	2	1	2	1	3
Halle	1	4	1	1	3	2	2
Lodz	2	4	5	2	3	2	1
Total score	6	18	11	10	11	5	10

Figure 7: Barriers to the establishment and maintaining of GBI across CS on the city-level, measures on a scale from 0-5

In addition to regional and city-level barriers, the ENABLE cities identified barriers specific to the **GBI interventions** (see Chapter 0 for an overview of the interventions and Figure 8 for a graphic representation of the barriers). While the overarching categories mirror those outlined above, examples focusing on the specific GBI interventions across the cities are provided as well as general findings.

As a *cultural barrier*, the Collserola Park in Barcelona suffered from the diverging visions of different stakeholders involved in the planning process. In Stockholm, the potential of the GBI intervention (i.e. a protected area) was assessed as not being tangible enough, despite inhabitants enjoying the high percentage of urban green in the city.

The GBI intervention in Lodz is no *political* priority for action, and there is a lack of regulations to push implementation.

Financial barriers also play a leading role in the lack of implementation on GBI intervention level. In Lodz, the GBI intervention received low investments from private actors and businesses and no private-public collaboration. In Stockholm, there is a competition for financial resources with other public services; this has resulted in an inability to secure a long-term budget being maintained for the GBI intervention. In Barcelona, insufficient financial incentives to trigger private stewardship action hindered implementation.

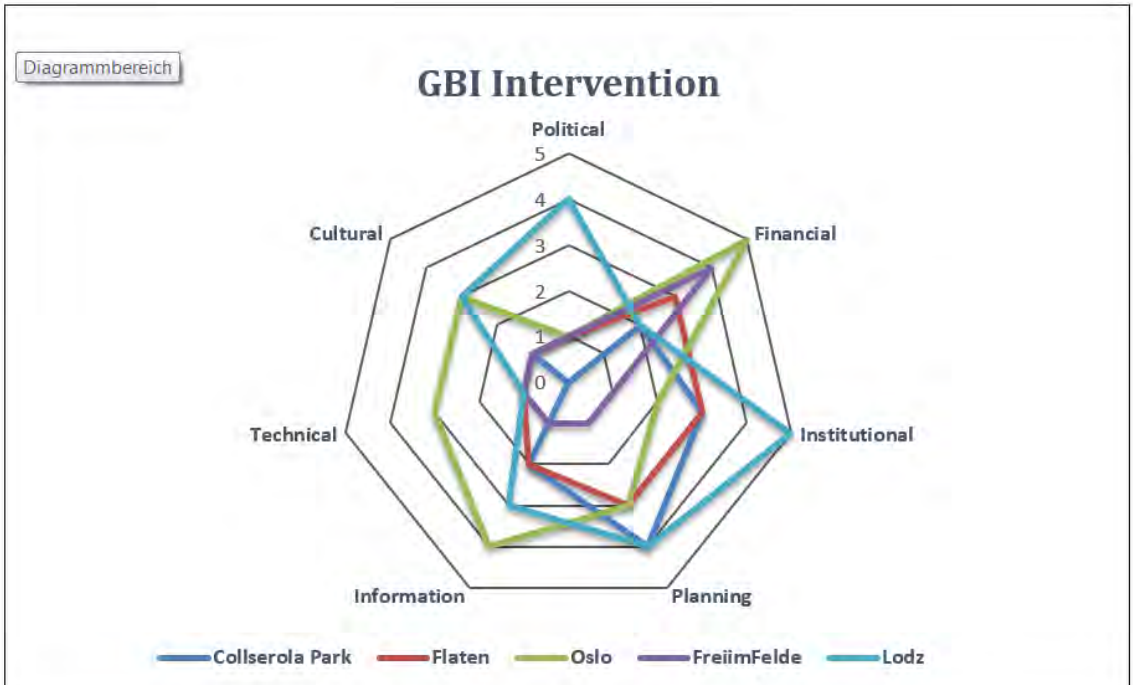
In comparison to the other cities, the *institutional barriers* of the GBI intervention in Lodz were determined as being very high. This is connected to a lack of institutional capacity as well as unclear

responsibilities and spread of competencies, a lack of collaboration between territorial entities, public procurement procedures that hindered innovative approaches and a general lack of trust. In Stockholm, the management of the nature reserve lacks a clear organizational hub, as city district affiliates have multiple management roles.

For the nature reserve Flaten in Stockholm, barriers were estimated as being quite average/low in comparison to the other cities, with the strongest barrier relating to the *planning* of GBI interventions. This emerges as a barrier given that the management of outdoor recreation is fragmented, i.e. different stakeholders involved in different interventions work in isolation due to a lack of resources to coordinate relevant actors.

For proper decision making in the Collserola Park in Barcelona, the *information* on assessment of species richness and habitats is insufficient. For green roofs in Oslo, spatial maps of green roof potential have been developed, but the financial and economic cost-benefit analysis for Oslo specifically are missing. The GBI intervention of Lodz is strained by a lack of data, risk assessments and feasibility studies. In addition, there is little interest for unconventional solutions and a general apprehension against the costs and unknown factors of nature-based solutions.

In Lodz a lack of technical information on the types of actions needed to facilitate development and establishment of GBI and a lack of experts focused on GBI lessens the readiness to investment in such solutions.



	Political	Financial	Institutional	Planning	Information	Technical	Cultural
Barcelona	0	2	3	4	2	0	1
Stockholm	1	3	3	3	2	1	1
Oslo	1	5	2	3	2	3	3
Halle	1	4	1	1	1	1	3
Lodz	4	2	5	4	3	2	3
Total score	7	16	14	15	10	7	11

Figure 8: Barriers to the establishment and maintaining of GBI across GBI interventions, measures on a scale from 0-5

Overall, the lack of financial resources and allocation of funds to invest in GBI is the most significant barrier to GBI implementation on a regional and city level, as well as for specific GBI interventions. Furthermore, a lack of institutional capacity, knowledge and expertise, lack of trust between stakeholders, and a lack of coordination between government departments and the absence of existing policy played a key role in the lack of investments into GBI interventions. A lack of political commitment was not deemed as major barrier across cities and GBI interventions, except for in Lodz. A lack of technical information on the types of actions needed to facilitate development and establishment of GBI is also not a major concern. Some major differences in barriers were identified between the city level and the GBI intervention implemented in the same city. In Barcelona, for example, cultural barriers highly affect the establishment of GBI as there is strong public opposition to the implementation of GBI measures more generally. However, on the level of the Collserola Park in the city, cultural aspects do not play a significant role.

6. Conclusions and recommendations

Urban green and blue infrastructure emerges as a consequence of a variety of drivers, including the policy and institutional frameworks in which they are embedded. The insights from the five ENABLE cities show that a meaningful implementation of GBI requires a political commitment at the national as well as the city level in correspondence with a long-term vision and must be operationalised by appropriate policy instruments. Based on the experiences gathered form this city review and findings of the analysis, a series of recommendations have been developed for the ENABLE and wider cities:

- **Strengthening existing policy frameworks to support GBI**: There should be a clear priority setting which commits cities to supporting GBI across governance scales. In this context, cities and national governments should set quantitative and binding targets and standards on GBI accessibility and availability. The quality of green areas, which also affects the provisioning of benefits and ecosystem services, needs to be taken into consideration in decision-making processes. Where possible, preference should be given to binding policy instruments, which can achieve greater impacts than is possible with voluntary instruments.
- **Improve the implementation of policies**: Tailored guidance, tools to support implementation/decision-making and or action plans to accompany policy instruments are needed to achieve the aims of specific policies or strategies and operationalise these. This would include, for example, the provisioning of evidence and proof of GBI effectiveness, support for weighing GBI solutions against traditional engineered approaches, guidance on stakeholder involvement, and building capacities within managing authorities.
- **Provide adequate financing and trigger investments in GBI:** National, regional and city governments should provide adequate funding for GBI through targeted programmes and initiatives, which are independent of short political term cycles and do not jeopardize the financial stability needed to achieve successful GBI initiatives and programmes. There is a clear need to move from financing purely grey solutions to financing GBI or hybrid (green and grey) solutions, recognizing the benefits of natural capital in financing mechanisms. Financing programmes should not only focus on pilot and demonstration projects, but should also allow for the implementation of GBI on a larger scale. Public programmes should be designed in a way that enable citizen-driven and bottom-up initiatives (e.g. the development and implementation of 'citizen neighbourhood concepts') and trigger investments from the private sector (business, foundations, NGOs etc.).

- **Integrate preferences and values of citizens for GBI in planning processes**: Preferences, values and diverse perspectives of citizens should be taken into account when planning and designing new open and green spaces in cities, which often help to address challenges such as human health, social cohesion and well-being in parallel. Such an approach can lead to the realisation of joint visions shared by both the city administrations and the general public. A participatory approach to sustainable urban development should thus become a mandatory component in planning processes in which residents are intended as the key beneficiaries.
- **Integrate GBI into the existing policy framework**, rather than treating it as an isolated programme; it should be pursued together with other complementary objectives such as climate change mitigation and adaptation, human health and well-being, improving air quality, local food production, stimulating the local economy, conserving biodiversity, etc. GBI is an integral part of increasing the sustainability of cities and requires an integrated approach spanning across isolated sectoral policies and departments.

Annex A. Overview of the policies analysed in the cities

City	Name	Scale	Instrument type	Bindingness	Mechanism(s)	Impact Potential	Impact(s)
Barcelona	General Metropolitan Plan (PGM), Urban Master Plan (PDU)	City	Plan/programme	Binding	Regulatory, planning/zoning	High	Environmental Social Economic
	SIXTELL (Territorial Information System for the Network of Open Areas in the province of Barcelona)	Regional	Plan/programme	Non-binding	Research/monitoring	Low	Environmental Social Economic Negative
	Barcelona Biodiversity and Green Infrastructure Plan 2020 (2013) & Stimulus programme for the city's urban green infrastructure : Government measure (2017)[1]	Local	Plan/programme	Binding	Regulatory	Medium	Environmental Social Economic
	TREES FOR LIFE - Master Plan for Barcelona's Trees (2017)	Local	Plan/programme	Binding	Regulatory, planning/zoning	Low	Environmental Social Economic
	Omplim de vida els carrers – La implementació de les superilles a Barcelona ("The Superblocks plan")	Local	Plan/programme	Binding	Regulatory, planning/zoning	Low	Environmental Social Economic
	Special Plan for the Protection of the Natural Environment and Landscape of the Collserola Mountain - Pla especial de protecció del medi natural i del paisatge del Parc Natural de la Serra de Collserola (PepNat - currently under formulation)	City	Plan/programme	Binding	Regulatory, planning/zoning	High	
	PGM / PDU	City	Plan/programme	Binding	Regulatory	High	
	SITXELL (Sistema de Información Territorial de la Red de Espacios Libres de la Provincia de Barcelona)	Regional	Plan/programme		Research/monitoring	Low	
Stockholm	Aldrig långt till naturen (Program for protection of urban nature by all municipalities in the County)	County	Plan/programme	Non-binding	Planning/zoning	Medium	Environmental Social Economic
	Outdoor recreation goals (10 goals for outdoor recreation 2012)	County	Guidance	Non-binding	Regulatory	Low	Environmental Social Economic
	RUFS – Regional development Plan for the Stockholm region and background reports regarding green infrastructure, outdoor recreation values and ecosystem services (SCC-TRF).	County	Plan/programme	Non-binding	Planning/zoning	Medium	Environmental Social Economic
	National Environmental Quality Objectives and implementation strategies: A good built environment; A rich plant and animal life (SCAB)	County	Guidance	Binding	Regulatory	Medium	Environmental Social Economic
	Municipal comprehensive land use plans + Municipal green plans	Municipality	Plan/programme	Non-binding	Regulatory, Planning/zoning	High	Environmental Social Economic
	Nature reserve management decision and management plan (2007)	Local	Plan/programme	Binding	Regulatory	High	
	Park programmes: Den gröna promenadstaden (2013)/Grönare Stockholm (2017); Green structure program Nacka (2011); Green structure plan Tyresö (2014)	Municipality	Plan/programme	Non-binding	Regulatory	Medium-low	
	Area programs, Detailed land use plans in the surroundings of the nature reserve	Municipality	Plan/programme	Binding	Regulatory, Planning/zoning	High	
	Pilot project Flaten (2016)	Municipa	Project	Non-binding	Research/monitoring	Medium	
	Strategi för grön infrastruktur (2018) (Strategy for green infrastructure)	Regional	Guidance	Non-binding	Research/monitoring	High	
Oslo	Oslo municipal plan (Draft 2017 of the Social and Area Development Plan – «Samfunns- og Arealdel)	City	Plan/programme	Binding	Regulatory, Planning/zoning	High	Environmental Social Economic
	Climate and energy programme	City	Plan/programme	Non-binding	Guidance/education		
	Strategy for City trees	City	Strategy	Non-binding	Regulatory	Low	Environmental
	Strategy for surface water (2014); Action plan for handling surface water(2016) ; Braskerud (2018): Draft Guidance on separation of surface water and overflow	City	Plan/programme	Non-binding	Administrative	High	Environmental Social Economic
	Urban Ecology Programme 2011 – 2026	City	Plan/programme	Non-binding	Regulatory	Medium	Environmental Social Economic
	Blue-Green Factor Guidance (BGF)	City	Guidance	Non-binding		Low	N/A
	Strategy for Building Integrated Green Structure	City	Strategy	Non-binding	Regulatory	High (at spatially targeted	Environmental Social Economic
	Blue-Green Factor (BGF) Guidance	City	Guidance	Non-binding	Guidance/education	Low	
	Action plan for handling surface/storm water	Local	Plan/programme	Non-binding	Regulatory		
	Strategy for Building Integrated Green Structures (BIG)	City	Strategy	Non-binding	Guidance/education		

Halle	Integrated Urban Development Concept (ISEK Halle 2025) Integriertes Stadtentwicklungs-konzept 2025	City	Plan/programme	Non-binding	Regulatory, Planning/zoning	High	Environmental Social Economic
	Regional development plan (Regionaler Entwicklungsplan – REP)	Regional	Plan/programme	Binding	Regulatory, Planning/zoning	Medium	Environmental Social Economic
	Preparatory Land-Use Plan (Flächennutzungsplan – FNP) for the City of Halle	Municipality	Plan/programme	Binding	Regulatory, Planning/zoning	High	Environmental Social Economic
	State development plan of Saxony-Anhalt	Regional	Plan/programme	Non-binding	Regulatory, Planning/zoning	Low	Environmental Social Economic
	Landscape-planning development concept	City	Guidance	Non-binding	Guidance/education	Indirect	Environmental Social Economic
	Integrated Urban Development Concept (ISEK Halle 2025)		Guidance		Guidance/education		
	„Zukunftsstadt 2050"	City	Plan/programme	Non-binding	Financial	High	
	Bürgerschaftliches Quartierskonzept Halle – Freiimfelde (Citizens Neighbourhood's Concept)	Local		Non-binding	Planning/zoning, Guidance/education	High	
	ExWoST Project – Green Urban Labs1	National	Plan/programme	Non-binding	Financial	High	
Lodz	Integrated Development Strategy of Lodz Metropolitan Area 2020+ (2017)	Regional	Strategy	Non-binding	Guidance/education, Research/monitoring	Medium	Environmental Social Economic
	Integrated Development Strategy of Lodz 2020+ (2012)	City	Strategy	Non-binding	Guidance/education, Research/monitoring	Medium	Environmental Social Economic
	Spatial Development Strategy of Lodz (2012)	City	Strategy	Binding	Regulatory, Planning/zoning	High	Enivronmental Social Economic
	Municipal Management and Environmental Protection Policy of the City of Lodz 2020+ (2012)	City	Law/regulation	Binding	Guidance/education, Research/monitoring	Medium/high	Environmental Social Economic
	The Study of Determinants and Directions of Spatial Development (2017, draft)	City	Guidance	Binding	Regulatory, Guidance/education	Medium	Environmental Social Economic
	Environmental Protection Program for Lodz Region for the Years 2012-2019 (2012)	Regional	Plan/programme	Non-binding	Regulatory, Research/monitoring	Low	Environmental Social Economic
	Integrated Development Strategy of Lodz Metropolitan Area 2020+	Regional	Strategy	Non-binding	Regulatory, Research/monitoring	Medium	
	Integrated Development Strategy of Lodz 2020+	City	Strategy	Non-binding	Education, Research/monitoring	Medium	
	Municipal Management and Environmental Protection Policy of the City of Lodz 2020	City	Law/regulation	Binding	Regulatory, Research/monitoring, Financial	High	
	City Climate Adaptation Plans	City	Plan/programme		Guidance/education, Research/monitoring, Financial	Low	
	The Study of Determinants and Directions of Spatial Development (Masterplan)	City	Plan/programme	Non-binding	Guidance/education, Regulatory	Medium	
	Local development plans	City	Plan/programme		Regulatory	High	
	Analysis and delineation of the river valleys and the recommendations for their development	City	Guidance	Non-binding	Research/monitoring, Guidance/education	Medium	
	Water Law	National	Law/regulation	Binding	Regulatory, Financial	High	